Title: Football Fanatics

Brief Overview:

This unit introduces the concept of line plots. Students learn the parts of a line plot and how to construct a line plot for a set of data. Students also learn how to find the mode, median, and range for data represented on a line plot. The data used during these lessons is both student-generated and teacher-generated. It is expected that students are already familiar with the terms mode, median, and range. During this unit the students will complete several football related activities required to enter a contest to win Super Bowl tickets.

NCTM Content Standard:

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

- Represent data using tables and graphs such as line plots.

Select and use appropriate statistical methods to analyze data.

- Describe the shape and important features of a set of data, with an emphasis on how the data is distributed.
- Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.

Grade/Level:

Grade 3

Duration/Length:

3 sessions; each session is 60 minutes

Student Outcomes:

Students will:

- Collect and organize data that can be displayed on a line plot.
- Construct line plots to represent sets of data.
- Identify the mode, median, and range for the data on a line plot.

Materials and Resources:

Day 1

- 1 copy of student resource "Football Fanatics Preassessment" per student
- 1 copy of teacher resource "Football Fanatics Preassessment Answer Key"
- 1 copy of student resource -"Super Bowl Ticket Contest" flyer
- 1 sticky note per student

- Chart paper (Before class, draw the following on the paper: a line for the line plot and the scale from 21 to 36).
- 2 football cutouts (refer to teacher resource "Football Cutouts") or 2 mini toy footballs
- 1 copy of teacher resource "Vocabulary Word Cards to Label a Line Plot"
- 1 copy of the student resource "Ages of Players for the Baltimore Ravens" line plot
- 1 copy of student resource "Points Per Game" data sheet per pair of students
- 1 copy of student resource "Average Points Per Game" table with team names and averages
- 1 piece of chart paper and 1 marker per pair or group of 3 students
- 1 copy of teacher resource "Points Per Game Line Plot Activity Answer Key"
- Envelopes, in which are placed the student resource "Line Plot Practice" (1 for each student who might need reteaching)
- 1 checklist of the parts of a line plot for each pair or group of students

Day 2

- 1 copy of teacher resource "Football Equipment Picture Cards"
- A piece of masking tape that stretches across the front of the room and numbers written on cards for the shoe size scale (Set up the line plot in the classroom prior to the beginning of class).
- 2 football cutouts (refer to teacher resource "Football Cutouts") or 2 mini toy footballs
- 1 copy of the student resource "Super Speed Drill" setup diagram
- Space outside and 2 cones per pair of students (Prior to class, arrange the cones outside in 2 rows with the rows spaced 5 yards apart).
- A timer or stopwatch
- 1 copy of the student resource "Super Speed Drill Line Plot" per student
- Student resource "Touchdown!" (1 for each student who might need reteaching)
- 1 copy of teacher resource "Touchdown! Answer Key"
- Student resource "How Could You Change the Super Speed Drill? (1 for each student who would benefit from enrichment)
- 1 copy of student resource "Exit slip for Super Speed Drill" per student

Day 3

- 1 blank jersey per student (refer to student resource "Creating a Jersey")
- Masking tape (1 small piece per student)
- Football cutouts (optional – refer to teacher resource "Football Cutouts") or 2 mini toy footballs)
- 1 copy of student resource "Making A Mini Football" directions sheet per student
- 1 piece of 8 ½ by 11 inch sheet of paper per student
- Optional: Pre-made paper footballs in case students can't make their own
- 1 ruler or tape measure per group of 3 students
- 1 1/2-inch long piece of masking tape per group of 3 students
- 1 copy of student resource "Kicking Practice" recording sheet per student

- 1 copy of student resource “How Far Did You Kick?” per student
- 1 copy of student resource “Cheers” for reteaching
- 1 set of game materials for each pair of students (student resources “Football Fanatics Line Plot Game Directions,” “Football Fanatics Game Board,” “Line Plot Game Cards,” and 1 die)
- 1 copy of student resource “Football Fanatics Summative Assessment” per student
- 1 copy of teacher resource “Football Fanatics Summative Assessment Answer Key”
- Student resource “Tickets to See the Super Bowl” (1 ticket per student)

Development/Procedures:

Day 1

Pre-assessment

- Give each student a copy of the “Football Fanatics Preassessment.” Read the directions together with the students. Emphasize to the students that you want to see what they already know about line plots. Remind the students that their score on this paper will not negatively affect their grade.
- Tell the students that they can begin working.
- Collect the worksheets and use the answer key to assess students’ knowledge of the concepts.

Engagement

- Display the student resource “Super Bowl.”
- Read the letter to the class.

Exploration

- Introduce the first challenge, which is called “Guess Our Age.” Tell the students that the goal of this activity is to find the typical age of a football player on the Baltimore Ravens.
- Explain to the students that they are going to guess the age that best represents the players on the Ravens. The students are allowed to pick any number between 21 and 36.
- Brainstorm why this range was chosen. Ask students to share their ideas. If needed, ask the following questions to elicit more information: Why do you think 15 is not a choice? Why do you think 50 is not a choice? Why do you think 21 is the lowest choice? Why do you think 36 is the highest choice?
- Give each student a sticky note. Ask the students to write their prediction on the sticky note.
- Tell the students to discuss with the other members of their table group how they could use their sticky notes to make a line plot. Ask students to share their ideas with the class.

Explanation

- Explain that the class will now make a line plot with their predicted ages.
- Display the pre-made line plot paper on the board.
- Tell the students that a line plot has a line at the bottom with a series of numbers from a number line written in order under that line. Ask questions such as: What are the numbers called? (The scale) What do you notice about the scale? (The smallest number is 21, and the largest number is 36. These were the limits given for the students' guesses.)
- Discuss the interval that is used. In this case, the numbers increase by one. Explain that line plots can also count by 2s, 3s, 4s, 5s, etc. depending on the data. The numbers need to be spaced evenly under the line.
- Call several students at a time up to the board to put their sticky notes on the line plot. Initially, let the students determine where to put the sticky note without any assistance. If needed, explain how the sticky note should go above the corresponding number. If another student had the same prediction, that second sticky note goes above the first.
- Ask: What do you notice about how the sticky notes are arranged? Discuss how the data is organized into columns, with one sticky note directly above another.
- Ask: What information can you tell about our data? If needed, ask more specific questions such as, "What was the youngest prediction? What was the oldest prediction? How many people predicted 29? What was the most popular prediction, and how do you know? How many more students picked _____ than _____?" (Fill in appropriate ages depending on your class' data). "How many people were included in this survey, and how do you know?"
- Explain that X's are typically used in line plots instead of sticky notes. Remove the sticky notes for the first few ages, and replace them with X's. Discuss why the X's need to be the same size.
- Tell the students that this line plot is not yet complete. Ask: What else do we need to add to our line plot? (A title and a label underneath the numbers). As a class, generate a title and label and write these parts on the line plot.
- Ask: What makes a line plot different from the other types of graphs we have studied? Give the students a minute to think about the question, and then they are to share their idea with another student. Ask for volunteers to share their ideas with the class.
- Tell the students that the class is now going to find the mode, median, and range of this data.
- Ask the following questions: What does mode mean? **(**The data point that occurs the most times). How can we find the mode of our data? (Look at what number had the most sticky notes). What is the mode?
- Then ask: What does median mean? (The middle number when the data is in order from least to greatest). Ask: How can we find the median of our data? Have students share what they might do to find the median on a line plot. Then give two students the football cutouts found on teacher resource "Football Cutouts" and have one stand at each end of the line plot. They will first hold the football over

the smallest and largest number and then, one step at a time, move toward the middle of the line plot until the median is found.

- Now ask: What does range mean? (The difference between the largest data point and smallest data point) Ask: "How can we find the range of our data?" (Find the largest number that was predicted and the smallest number that was predicted. Then subtract the two numbers). Determine the largest and smallest values and write the subtraction problem on the board. Then ask: "What is the range?"
- Say: "Now that we have made a line plot, let's look back at the parts we need to have on a line plot. What is one part that a line plot must have?"
- Have a student share an idea. Give that student the appropriate line plot part card from the student resource "Vocabulary Word Cards to Label a Line Plot." The student is then to come up to the front and place that card next to that part of the line plot. For instance, if the student said, "A title," you would give that child the "Title" card. The student would then place the "Title" card next to the title of the line plot.
- Then have another student share an idea. Let that student place the appropriate line plot part card on the line plot. Continue until all of the parts have been identified.
- Say: "Our line plot shows your predictions of the typical age of a Ravens player. Are you ready to see the real ages of the Ravens?"
- Display the line plot of the Ravens ages found on teacher resource "Ages of Players for the Baltimore Ravens." Discuss the "Questions to Explore" written at the bottom of that line plot. Ask the students if their prediction was close to the actual mode or median. This line plot was created from data found at http://www.altiusdirectory.com/Sports/baltimore-ravens-roster.html. Another excellent resource is http://www.nfl.com~~)~~.

Application

- Assign partners, or divide the students into groups of three.
- Say: "You are going to be making a new line plot with your partner. Instead of looking at the typical age of a Ravens player, we are going to focus on how many points teams scored during each of their games last year. Let's make some predictions. Take a minute to think about how many points you think a football team would normally score in one game. Who would like to share their predictions? Have several students share their predictions and explain why they chose that number.
- Give each pair or group a copy of student resource "Points Per Game" data sheet. As a class, read the directions at the top of the paper. Ask: "What is the AFC?" (It is one of the conferences in the NFL, and the Ravens are members of this conference). Ask: "What do the numbers represent?" (Each number is how many points an AFC team typically scored in one game last season).
- Give each pair or group a piece of chart paper, and a marker.
- Explain the assignment. The students are to create a line plot to represent the "Points Per Game" data. Remind students that they must include all of the required parts on their line plot. See answer key to assess students' ability to create a line plot.

Differentiation

Reteach
To help those students who need additional practice, you may use the line plot activity found on student resource "Line Plot Practice." Using an envelope that contains the cards displaying the elements of a line plot, the students are then to place each card in the appropriate place on chart paper to construct a line plot. When the students are finished, they can check their completed line plot using the answer key in the envelope.

Enrich
Have the students find the mode, median, and range for the data on their line plot. The students can write their answers on the back of the student resource "Points Per Game" paper.

Assessment
For this informal assessment, give each group of students a copy of student resource "Line Plot Checklist." Give the students time to self-assess their group's line plot using the checklist. Then invite one group to bring its line plot up to the front of the room. As a class, assess how well that group constructed the line plot. Read aloud each item on the checklist and ask the rest of the class to determine whether the displayed line plot meets the criteria. Then invite a second group to share its line plot with the class. Again, have the other students use the checklist to assess the displayed line plot. Then pose questions to the entire class, such as: "How did you decide what the smallest and largest numbers on the number line should be? How many teams are in the AFC? How do you know? Is there a mode? How do you know? What is the range? How do you know? Which number do you think represents the Ravens?" (Refer to the teacher resource). Then collect all line plots and checklists for assessment.

Day 2

Engagement

- As a class, brainstorm the equipment that players need to play football. As ideas are shared, place the appropriate picture card from teacher resource "Football Equipment Picture Cards" or write the words on the board. Make sure football cleats are mentioned.
- Then pose the following situation: "You are getting ready for another football season, but your football cleats from last year are too small now. You need to buy new ones. Think about what size shoes you will buy."
- Ask some students to share their shoe sizes with the rest of the class. Discuss how shoe sizes are numbered and that there can be half sizes.
- Tell the students that they are going to make a human line plot to show this information.

Exploration

- Say: “I started creating our human line plot. I have a strip of masking tape that I placed on the floor. I also wrote shoe sizes on cards and arranged the cards in order from least to greatest along the number line. Each of you will represent one piece of data on this line plot. When I call your table group, come up and stand where you think you should be.
- Invite each table group of students to come forward, one table at a time, and direct them to stand in the appropriate place on the line plot that indicates their shoe sizes.

Explanation

- While the students are still standing in their lines, ask: “How did you know where to stand?” (I found the number that matched my shoe size and stood on the other side of the masking tape). Also ask: “What did you do if someone had the same shoe size and was already standing in the line plot?” (I stood behind them to make a column).
- Ask: “What is the smallest shoe size that we have in this class, and how do you know? What is the largest shoe size that we have, and how do you know? What do you notice about the height of the students with the smaller sizes and the larger sizes?” (Taller students typically have a larger shoe size, and shorter students have a smaller shoe size). **“**What is the mode of our data? How do you know? What is the range? How do you know?”
- Draw a line plot line and the scale on the board. Have students for each shoe size tell how many people had that size. Record the correct number of Xs on the board.
- Say: “We also want to find the median of our data. What does the median tell?” (The middle number when the data is in order from least to greatest). “How did we find the median on our line plot yesterday?” (We put one football at one end of the line plot and another football at the other end. Then we moved each football one step at a time toward the middle until we found the median).
- Ask: “How can we find the median of our line plot?” Have students share their ideas.
- Then give a student with the smallest shoe size a football cutout and give a student with the largest shoe size a football cutout or a mini toy football. Those students need to pass the football to the next student, and then the two original students can return to their seats. The two students who now have the footballs pass the footballs to the students next to them, and two more students can sit down at their desks. Continue this process until only the student(s) representing the median are still standing. Identify the median. Then the student(s) can return to his/her seat.
- Direct the students’ attention to the line plot on the board, which was created using the data from the human line plot.
- Say: “Think back to the line plots we looked at yesterday. What is different about this line plot’s scale?” (It counts by ½. Yesterday we were counting by 1). Ask: “Why did we include the halves?” (Shoe sizes come in whole sizes and half sizes).

- Ask: “What else do we need to add to this line plot?” (A title and a label). Brainstorm an appropriate title and label. Write in those parts on the line plot.
- Ask: “If someone from another school was looking at our line plot, how would that person know the number of people who were surveyed?” (Since each X stands for one person, count the total number of X’s).

Application

- Say: “Once you buy your football cleats, you can begin practicing just like the NFL players. Today we will work on our running by practicing the ‘Super Speed Drill’.”
- Divide the students into partners, and take the class outside.
- Direct each pair to stand next to one of the cones.
- Explain the procedure. “Say: I have set up cones five yards apart. You are standing next to your pair’s “starting cone.” The goal is to see how many times you can run from one cone to the other in one minute. I will keep the time. While one person is running, the other partner is to keep track of how many times the person runs from one cone to the other. Then you will trade roles. The runner becomes the counter, and the counter becomes the runner. Remember, you are counting the number of times your partner runs from one cone to the other, not from one cone to the other and back again.” (You may want to demonstrate this by having a student run for 30 seconds while everyone counts).
- Tell the students to decide who is running first. The runner needs to stand next to that pair’s “starting cone.” The counter should be standing several feet away from that cone.
- Say: “On your mark, get set, GO!”
- Time the students for one minute.
- Have the counter tell the runner how many times he/she ran from one cone to the other. The runner needs to remember this number.
- Direct the students to switch roles. Time the second group of runners for one minute.
- Have the counter tell the runner how many times he/she ran from one cone to the other.
- Tell the students to collect the cones.
- Say: “We are going to head back to our classroom now. As you come into the room, write your number of laps on the board. Do not write your name by it.”
- Take the class back inside. As the students reenter the classroom, they should write their numbers on the board.
- Say: “You will now be making a line plot of this data. I expect you to have all of the required parts on your line plot. Let’s review what you need on a line plot. What is the first step in making your line plot?” (Draw the line and write the scale). “What is our scale going to look like and how do you know?” (Students should respond by identifying the smallest data point. The number line will start with that number and count by 1 until they get to the largest number in the data set). “What would you do next?” (Draw the X’s). “What two other parts do you need after that?” (A title and label).

- Say: I am going to distribute out the paper for this activity. On the back of the sheet, write down the numbers that are on the board. Then begin to make your line plot.
- Give each student a piece of blank line plot paper. The students can begin working on their line plots.

Differentiation

Reteach
The following activity is appropriate for students who are not yet able to independently construct an entire line plot. Give those students a partially completed line plot, student resource "Touchdown." Ask the student to name a piece of the line plot that is missing. Give the students an opportunity to fill in that information. The student can complete the rest of the sheet with peer assistance from another student, periodic teacher check-ins, or continual adult assistance, depending on each student's needs. See answer key to assess students' ability to create a line plot.

Enrich
The following modification is appropriate for a class of more capable students. Instead of having the running course and cones already set up, have the students assist in arranging the course. Explain that each pair of students will get two orange cones and a yardstick. The students need to mark off a five yard space. Brainstorm how this can be done. Then go outside. Once outside, have the students set up their running space. The easiest method is to set down one cone and then measure 5 yards from that spot. The students can then place the second cone 5 yards away from the first.

The following activity is appropriate if a select group of students would benefit from enrichment. Give those students a copy of the student resource "How Could You Change the Super Speed Drill?" The students are to work in partners to answer the questions on that sheet.

Assessment
Give each student a copy of student resource "Exit Slip for Super Speed Drill". Read the directions with the class. Collect the line plots and Exit Slips at the end of the period.

Day 3

Engagement
- Ask: "Who is your favorite football player?" Have several students share their ideas.
- Ask: "Do you know what their jersey numbers are?" Again, have some students share with the class.
- Say: "Today you are going to design your own football jersey. If you could choose any number between 1 and 15, what number would you choose? Think about it."

Exploration

- Give each student a blank jersey sheet. The students are to write a number between 1 and 15 on it, and then they can design the rest of their jersey. While students are working, put a small piece of masking tape on each student's desk. Let the students work on their jerseys for about 10 minutes.
- Then say: "Time is up for designing your jerseys. Roll up your piece of tape, and put it on the back of your jersey. Put the jersey on your desk with the tape side facing up."
- Say: "I wonder which numbers will be chosen more frequently and less frequently? Challenge students to predict which numbers will be the most popular and least popular. We are going to use your jerseys to make a class line plot on the board. I am going to ask you some questions, but I am not going to help you with the answers."
- Ask: "If we want to make a line plot, what is the first step?" (Draw a line and write the scale under the line). Call on a student to come to the board and make those elements of the line plot. That student can also put his/ her jersey (X) above the appropriate number.
- Ask: "Now what do we need to do?" (Hang up the rest of the jerseys). Have the other students come up and place their jerseys on the line plot.
- Ask: "Do we need anything else?" (A title and a label). Choose students to add these elements to the graph. After each part is added, ask: "Do we need to add anything else?" Continue with this questioning until the students determine that the line plot is complete.

Explanation

- Discuss the line plot the class created. Begin by asking: "Did we use the correct scale? How do you know? Are the numbers evenly spaced?"
- Say: "Now let's look at the jerseys. Are they arranged correctly? How do you know? Are they evenly spaced so they line up correctly in each column?"
- Ask: "What is the mode of the data? How do you know? What might be the reason why this number is most popular?"
- Ask: "What is the median?" (Use the football cutouts if needed to have students demonstrate how to find the median).
- Ask: "What is another question that we can ask about this line plot?" Have students share their ideas, and answer the questions as a class.

Application

- Say: "Now that we have our jerseys, we each need a football. We are going to be making our own mini footballs today."
- Give each student a copy of the student resource "Making a Mini Football" and a blank sheet of white paper. The directions are adapted from those found at http://origami.lovetoknow.com/Origami_Football. Model step-by-step how to make the football. Have the students do each step with you. You might want to have some pre-made paper footballs incase students have difficulty folding these.

- Say: “The Ravens have a job opening for a new kicker. What does a kicker do in football?” (kicks field goals and kickoffs) **“**We are going use our new footballs to help us practice our kicking. Instead of kicking with our feet, we are going to use our fingers.”
- Demonstrate how to “kick” with your fingers. Hold the football so one corner is touching the table (or desk or floor). Hold the football with one hand. With your other hand, use your thumb and index finger to flick, or “kick” the football. Give the students a minute to practice kicking their football off their desk.
- Present the challenge. Give each student a copy of student resource “Kicking Practice.” Read over the directions as a class.
- Then say: “You will be working in groups of three during this activity. Each of you will have the opportunity to be the kicker, the measurer, and the recorder.”
- Say: “Let’s talk about the kicker. How many times is the kicker punting?” (20). “I will give each group a piece of masking tape to put on the floor where you are working. The kicker will put the football down on the tape each time. When someone kicks, one corner of the football must be on the tape. It can be any corner of the football. Does anyone have any questions about what the kicker needs to do?”
- Say: “Before we move on to the measurer’s job, I would like each of you to take out your pencil. On each side of your football, draw a small dot in the middle of the football. This will be important when we measure the distance you kick the football.”
- Say: “Now let’s talk about the measurer’s job. What is the measurer measuring?” (how far the football traveled). “What unit is the measurer using?” (inches). The measurer needs to measure to the nearest inch. From where would you start measuring, and why?” (The measurer starts at the masking tape because that is where the kicker is starting). “How far do you measure?” (You measure the distance to where the football lands). We all need to measure to the same part of the football. The measurer will measure from the tape to the dot in the middle of the football. Does anyone have any questions?”
- Say: “The last job is the recorder. The recorder is responsible for writing each measurement on the kicker’s worksheet. Are there any questions about what the recorder does?”
- Divide the students into groups of three, and assign each student in each group a number from 1-3. Give each group a yardstick (or tape measure) and a piece of masking tape. Spread the students out around the room. Have the students place the masking tape on the floor.
- Say: “Each of you will have the opportunity to be the kicker, measurer, and recorder. Think of the number that I assigned you a minute ago. If you are a 1, raise your hand. You will be the first recorder. If you are a 2, raise your hand. You will be the first measurer. If you are a 3, raise your hand. You will be the first kicker. You may begin your kicking practice.”
- When the groups are finished the first round of punting, reassign new roles. Say: “Think back to the number I assigned you when we started. Raise your hand if you are a 1. You are now the measurer. Raise your hand if you are a 2. You are

now the kicker. Raise your hand if you are a 3. You are now the recorder. Begin your second round of kicking practice."

- When the groups are finished the second round of punting, reassign roles for the next time. Say: "Think about your number again. If you are a 1, you are now the kicker. If you are a 2, you are now the recorder. If you are a 3, you are the measurer." Continue alternating roles until 20 punts have been made, measured, and recorded.
- When the groups are finished, direct the students to remove their masking tape from the floor and throw it in the trash. The students are then to return to their seats with their mini football and student resource "Kicking Practice" recording sheet.
- Say: "Each of you is now going to use the data on your recording sheet to make a line plot."
- Give each student a copy of student resource "How Far Did You Kick?". Read through the directions as a class. The students are then to begin working individually on this assignment.

Differentiation

Reteach

Students will learn several chants/cheers that will help them to remember the parts of a line plot. These can be found on teacher resource "Cheers." These can be done as a whole class so as not to single out those who are having trouble. The rest of the class will enjoy doing the cheers also.

After learning the cheers, pair up a student who needs more help with a student who has been successful with creating line plots. Ask them to talk about the parts of the line plot and what information they can gain from this. Challenge the more capable student to "quiz" the other student about the parts of the line plot.

Enrich

Arrange the students in groups of three to use the student resource to play the "Football Fanatics Line Plot Game." Make copies of the game board, line plot question cards, and directions for each pair of students. Allow students sufficient time to play.

Summative Assessment:

Distribute a copy of student resource "Football Fanatics Summative Assessment" to each student. Given a line plot, students will answer questions about the data being displayed. The students will also complete a BCR explaining how to find the mode of the data shown on the line plot. An answer key is provided.

Refer to the teacher resource "Tickets to See the Super Bowl." Distribute the tickets as directed at the top of that sheet.

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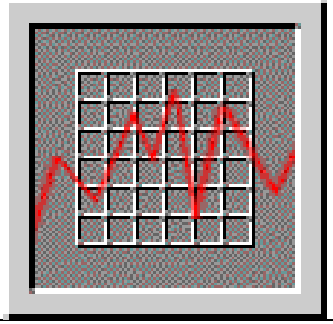
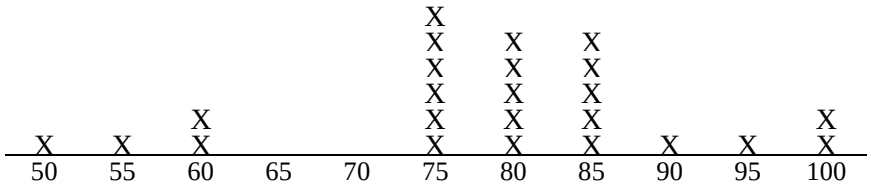
Football Fanatics Preassessment

Name _____ Date _____

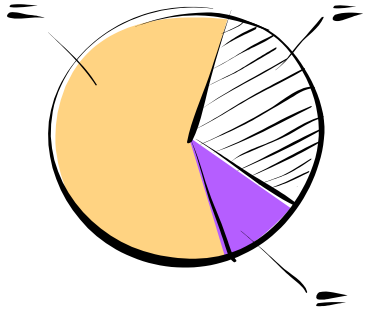
Directions: Study the graphs in the table below. Select the graph that shows a line plot. Circle the graph you chose. Then briefly explain why you chose that graph.



Social Studies Test Scores



Scores in Percentage Points



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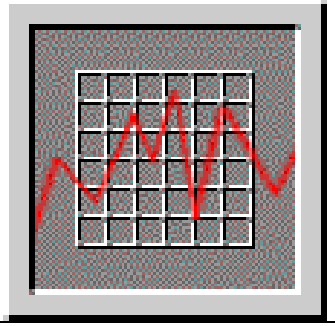
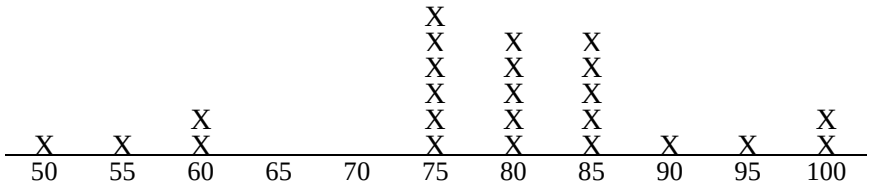
Football Fanatics Preassessment – Answer Key

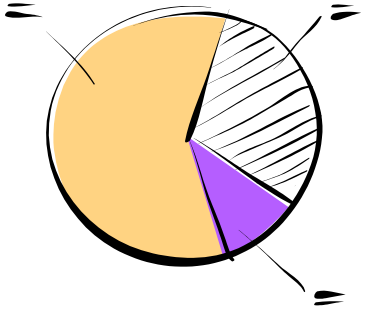
Name _____ Date _____

Directions: Study the graphs in the table below. Select the graph that shows a line plot. Circle the graph you chose. Then briefly explain why you chose that graph.



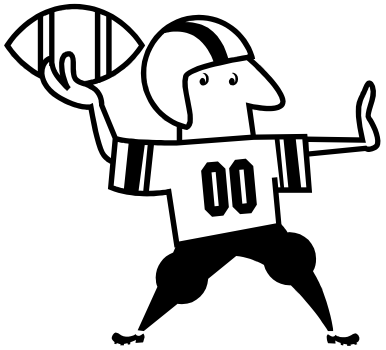
Social Studies Test Scores





Social Studies Test Scores should be the graph that the students circle to show that they know what a line plot is. Sentences explaining why they selected this graph will vary but should explain that they know that it shows frequency of data along a number line.

Super Bowl Ticket Contest!



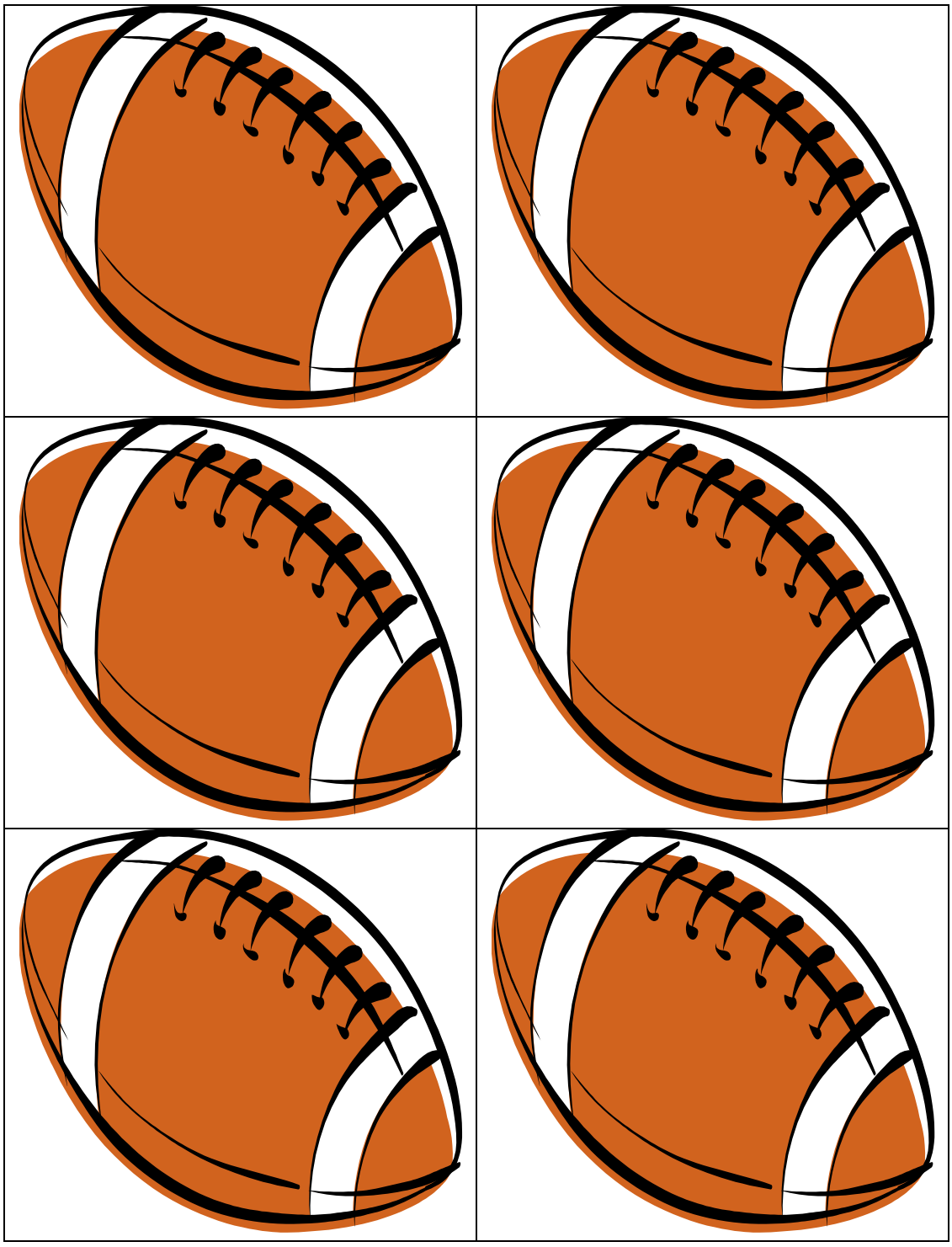
Win tickets to see the Super Bowl!

In order to be entered into the contest you must complete a series of football related challenges including:

- **Guess the age of the Baltimore Ravens football players**
- **Race to see if you are as speedy as a Baltimore Raven**
- **Fold a paper football and shoot a paper football through "finger goalposts"**
- **Collect data related to football scores, shoe size and running**
- **Create line plots**
- **Analyze the data in order to determine the median, mode and range**

Are YOU up for the challenge?

Football Cutouts



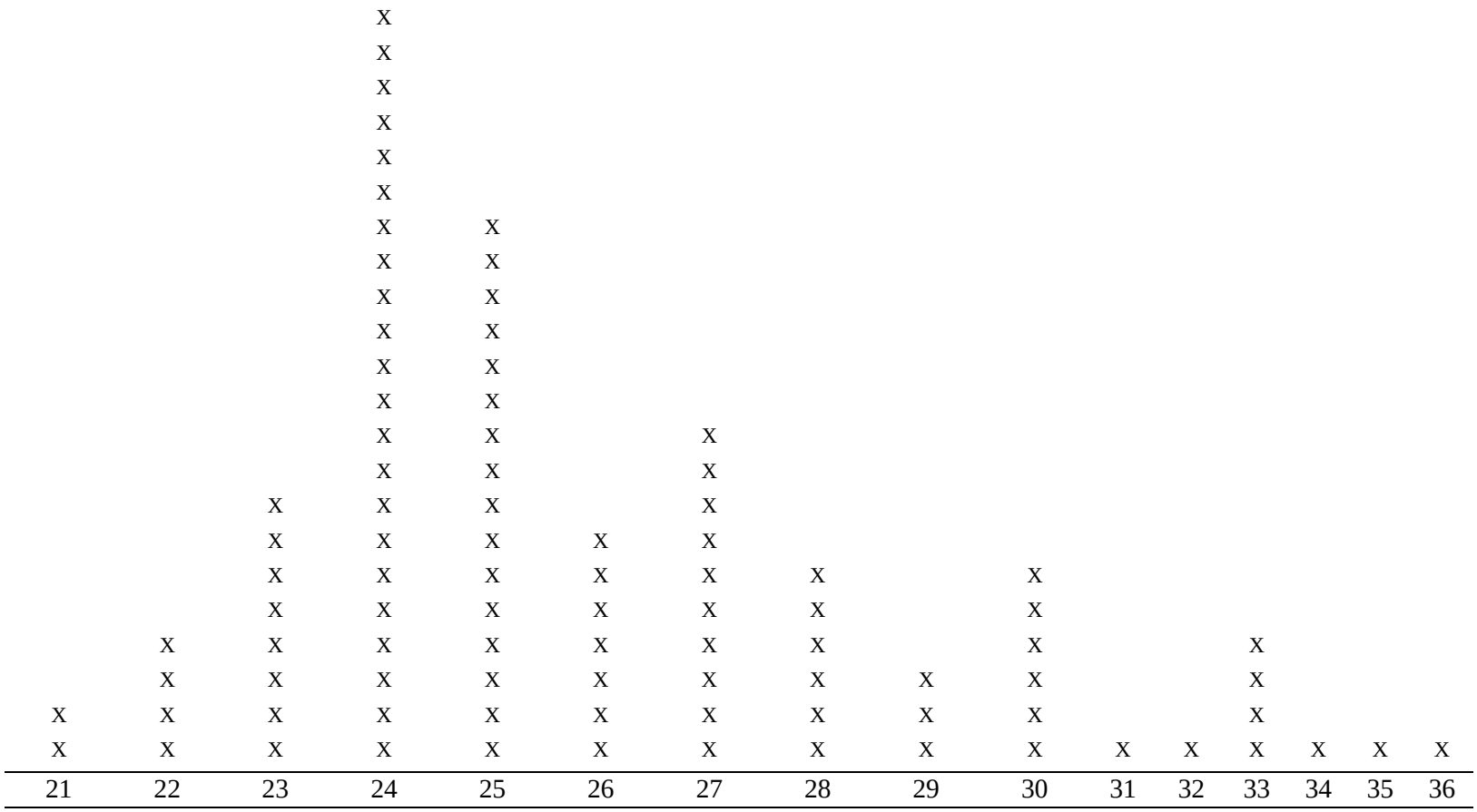
Vocabulary Word Cards to Label a Line Plot
(2 pages)

Copy and then cut apart the following cards. Use these to have the students label a line plot. You might put magnets or tape on the back of the word cards in order to attach them to the board.

Cluster
Cluster
Gap
Gap
Label
Line Plot

Median
Mode
Number Line
Numbers/Scale
Title
X’s for Data

Ages of Players for the Baltimore Ravens-2010 Roster (as of July 2010)



Age in Years

Questions to explore: 1) What is the mode? 2) What is the median? 3) What is the range? 4) How did you figure these out?

Names _____

Points Per Game

The data below is the typical number of points scored per game by each AFC team during the 2009 season. Use this data to make a line plot. Cross off each number as you add it to your line plot.

18	26	20	12	16	23
24	19	18	24	27	23
22	28	15	22		

Names _____

Points Per Game

The data below is the typical number of points scored per game by each AFC team during the 2009 season. Use this data to make a line plot. Cross off each number as you add it to your line plot.

18	26	20	12	16	23
24	19	18	24	27	23
22	28	15	22		

Average Points per Game for the National Football League AFC Teams – 2009

AFC Team Name	Average Points Scored per Game
Baltimore Ravens	24
Buffalo Bills	16
Cincinnati Bengals	19
Cleveland Browns	15
Denver Broncos	20
Houston Texans	24
Indianapolis Colts	26
Jacksonville Jaguars	18
Kansas City Chiefs	18
Miami Dolphins	23
New England Patriots	27
New York Jets	22
Oakland Raiders	12
Pittsburgh Steelers	23
San Diego Chargers	28
Tennessee Titans	22

“Points Per Game” Line Plot Activity Answer Key

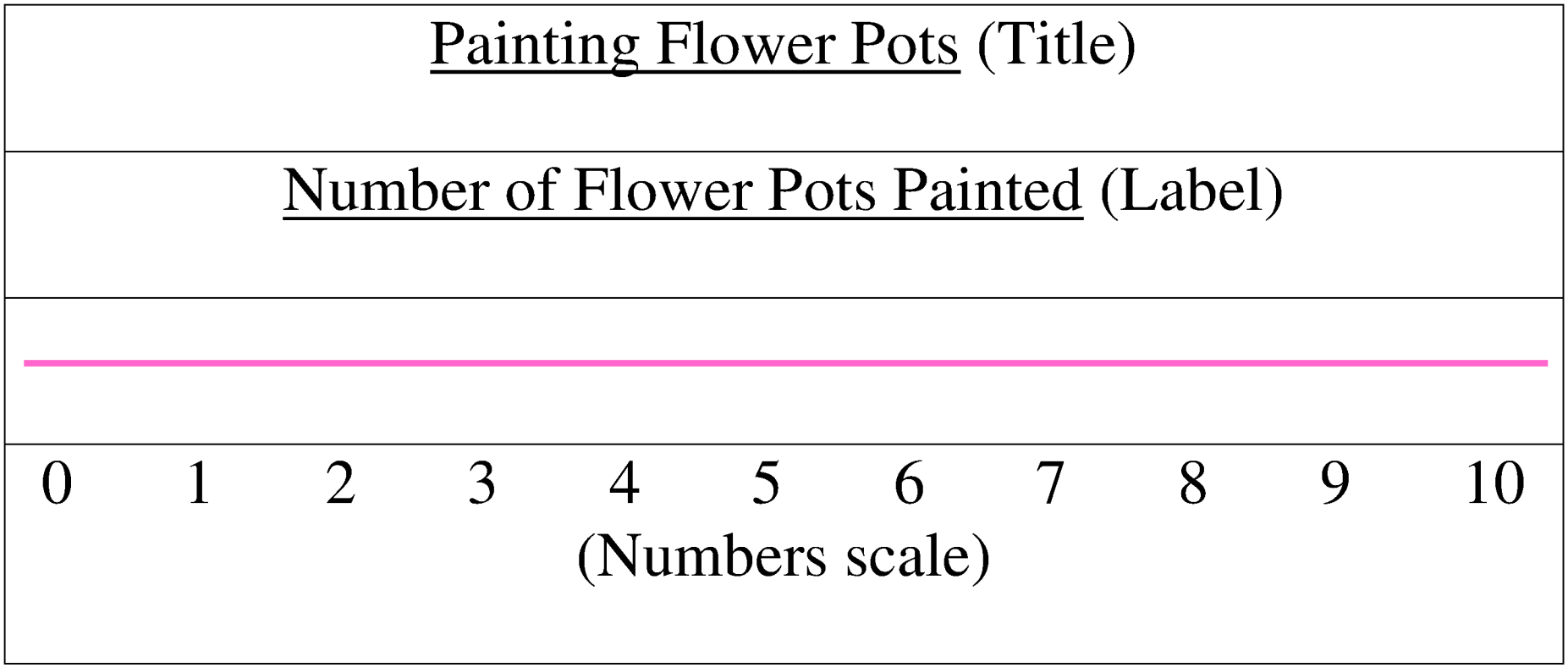
Average Points per Game for National Football League AFC Teams - 2009

						X				X	X	X				
X			X	X		X	X	X		X	X	X		X	X	X
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

Average Points per Game

Line Plot Practice

Cut apart the following parts of a line plot. Place them in an envelope for students who need extra practice recognizing where parts of a line plot belong. They should be directed to put their X's in the correct place according to the data on the table enclosed.



Line Plot Practice

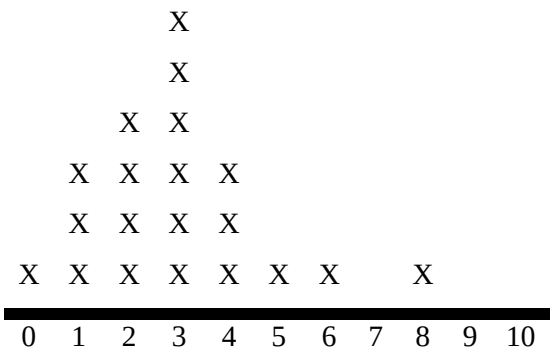
X	X	X	X	X
X	X	X	X	X
X	X	X	X	X
X	X	X	X	X

Cut these two pieces apart. Students will use one part to place the data (X's) on the line plot. The other half is the answer key and can be placed in an envelope for the students to use to self-check.

Line Plot Practice

Data for Placing X's for Practice Creating a Line Plot - Number of Flower Pots Painted	Answer Key for Practice Creating a Line Plot
0- X	
1- XXX	
2- XXXX	
3- XXXXXX	
4- XXX	
5- X	
6- X	
7-	
8-X	
9-	
10-	

Painting Flower Pots (title)



Numbers (scale)

Number of Flower Pots Painted (label)

Line Plot Checklist

Use the following checklist to evaluate the line plot your group created. Check to see if you have it all!

Line Plot Element	Check here if you have it!
Title	
Label under the number line	
Number line	
Numbers (scale) written correctly	
X's drawn correctly	

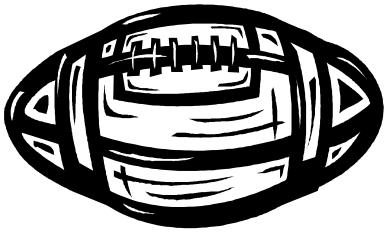
Line Plot Checklist

Use the following checklist to evaluate the line plot your group created. Check to see if you have it all!

Line Plot Element	Check here if you have it!
Title	
Label under the number line	
Number line	
Numbers (scale) written correctly	
X's drawn correctly	

Football Equipment Picture Cards

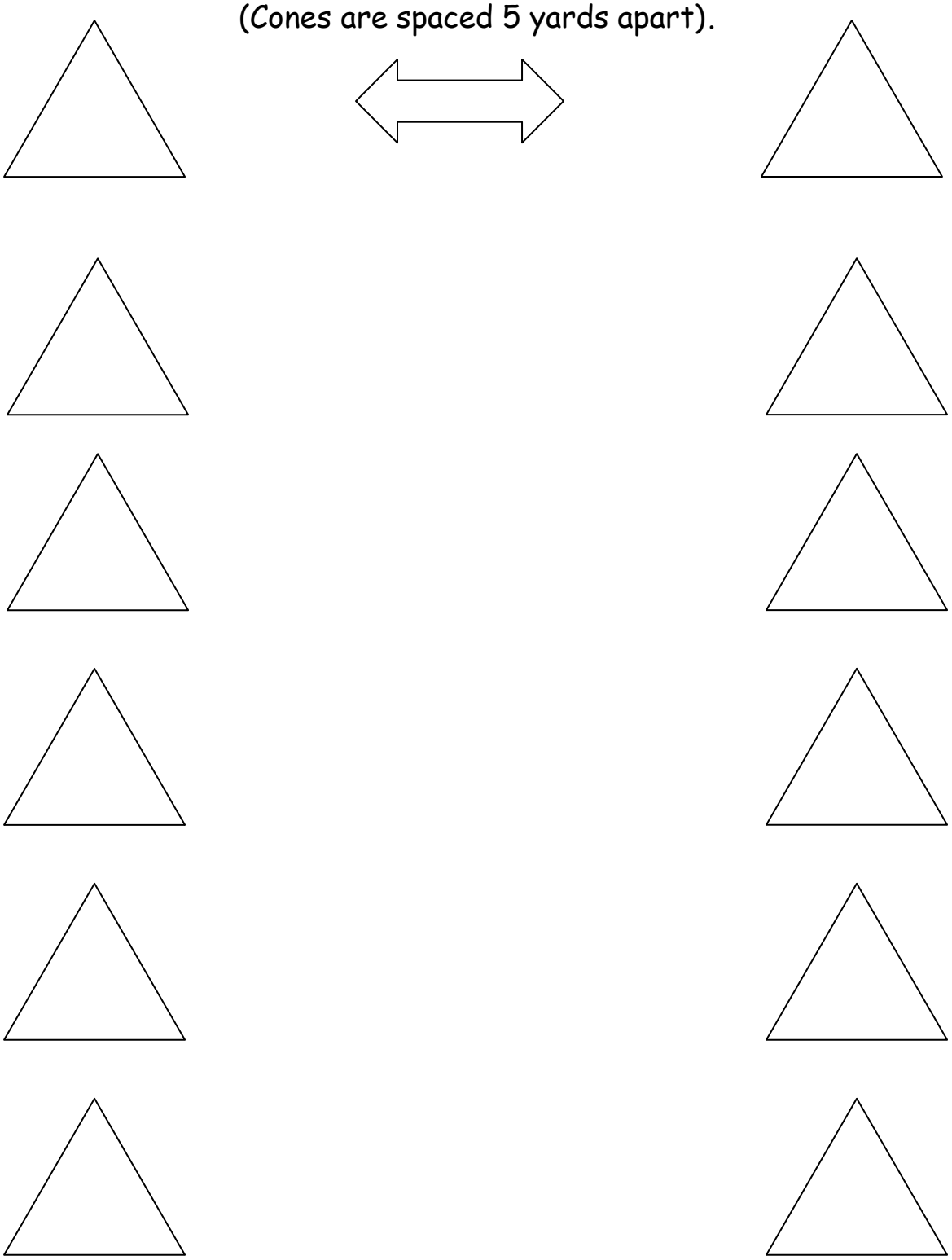
Use the following football equipment picture cards as part of the Engagement section for Day 2. Copy and cut apart.

HELMET 	**FOOTBALL** 
SHOULDER PADS 	**GOAL POSTS** 
PLAYERS 	**CLEATS** 

"Super Speed Drill" Setup

The diagram below shows how to set up for the Super Speed Drill.

(Cones are spaced 5 yards apart).



Name _____ Date _____

Super Speed Drill Line Plot

In the space below, copy the data for the number of times that each person in your class ran five yards.

Now construct a line plot to display this data.

- -When setting up your scale, remember to find the smallest data point and the largest data point.
- -Make sure the numbers on your scale are in order and evenly spaced.
- -Carefully write in the correct number of X's.
- -Add a title and label.

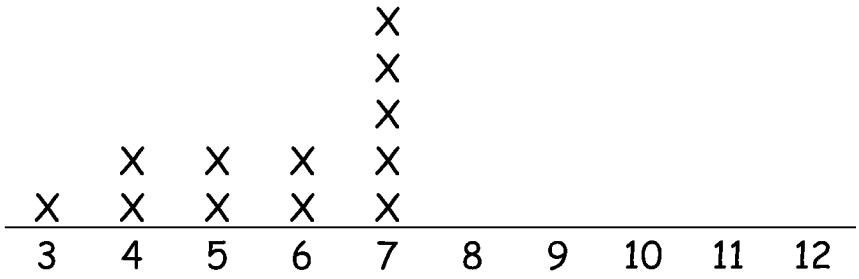
Name _____ Date _____

Touchdown!

Bobby plays football on his community team. Bobby's coach collected data on the number of touchdowns thrown by the quarterbacks in the league. The data is listed below.

9	5	12	9	3	7	6	8	9	10	8	7
7	9	10	8	4	6	7	11	4	7	5	

Bobby's coach started making a line plot to display this data, but he ran out of time to finish it. Your job is to determine what parts of the line plot are missing, and complete the line plot.



Touchdown! Answer Key

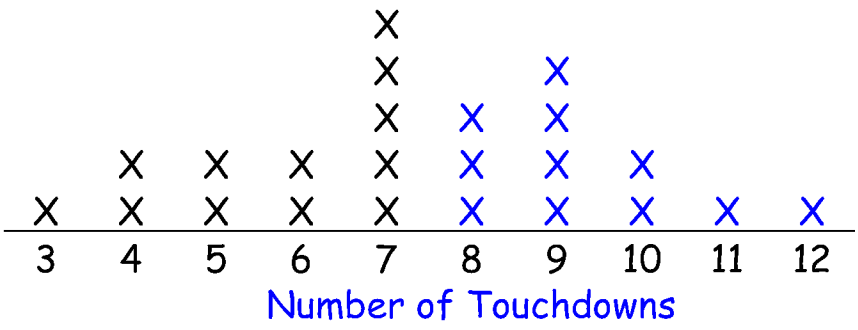
(Answers/ added information are in blue).

Bobby plays football on his community team. Bobby's coach collected data on the number of touchdowns thrown by the quarterbacks in the league. The data is listed below.

9	5	12	9	3	7	6	8	9	10	8	7
7	9	10	8	4	6	7	11	4	7	5	

Bobby's coach started making a line plot to display this data, but he ran out of time to finish it. Your job is to determine what parts of the line plot are missing, and complete the line plot.

How Many Touchdowns Quarterbacks Threw



Name _____ Date _____

How Could You Change the Super Speed Drill?

Work with a partner to answer the following questions.

1. If you wanted to know how many times someone could run 10 yards in one minute (instead of 5 yards), what could you do?

_____

_____

_____

2. What other data could you collect from the Super Speed Drill?

_____

_____

3. How might a football coach use the data gathered from the Super Speed Drill?

_____

_____

_____

4. What would you do if you could design your own Super Speed Drill?

_____

_____

_____

Exit Slip for Super Speed Drill

Name _____ Date _____

Write 3 facts that you could learn by studying the line plot that you created today about the running activity. Remember to include vocabulary that we have discussed that relates to line plots.

_____

_____

_____

_____

_____

Exit Slip for Super Speed Drill

Name _____ Date _____

Write 3 facts that you could learn by studying the line plot that you created today about the running activity. Remember to include vocabulary that we have discussed that relates to line plots.

_____

_____

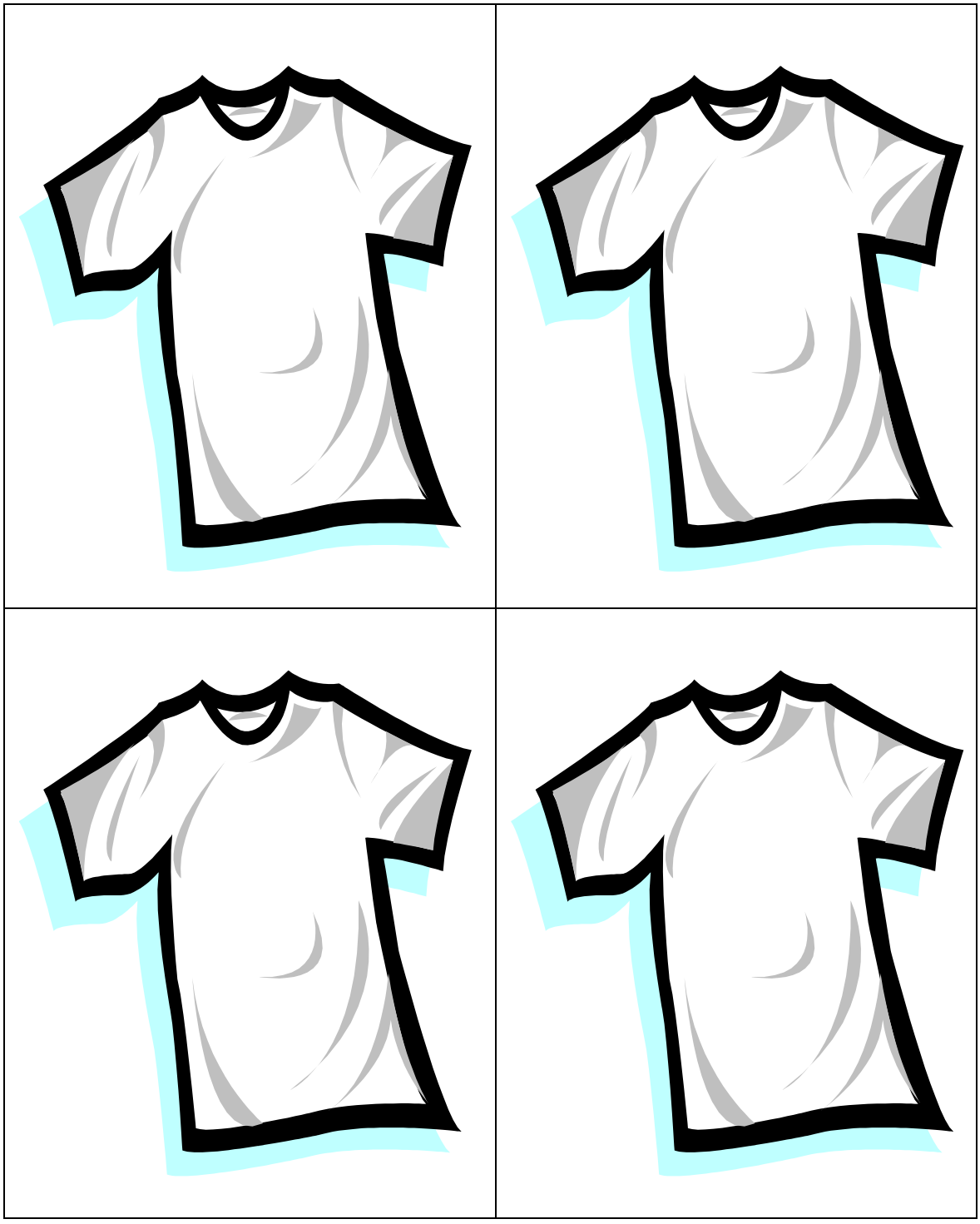
_____

_____

_____

Creating a Jersey

Duplicate copies of this sheet so that every student in your class has a jersey. Cut them apart and distribute as directed on Day 3.



Making A Mini Football

1. Place your paper on your desk so that one of the short sides is closest to you.

2. Fold the paper "hotdog style" so that you now have a long rectangle. Crease the paper, and then unfold it.

3. Fold the long sides of the paper in toward the center crease that you made in Step 2.

4. Refold your paper along the original center crease, so that you now have a long, thin rectangle.

5. Pick one end of the rectangle, and bring one corner over to create a right triangle.

6. Fold the entire triangle up to create another triangle.

7. Repeat this process. Keep wrapping the length of the paper around the triangle until there is only a small part of the paper left.

8. Hold your folded triangle down with one hand, and fold the remaining paper up almost all the way. Tuck the remaining flap inside your triangle.

Name _____

Kicking Practice!

Now that you have your football, it is time to practice your kicking skills. In order to be the Ravens' new punter, you need to kick your football as far as you can. The distance your football travels will be measured to the nearest inch, and you will kick 20 times. The recorder for your group will write the measurements on this paper so that you can keep track of your progress.

Punt 1	_____ in.	Punt 11	_____ in.
Punt 2	_____ in.	Punt 12	_____ in.
Punt 3	_____ in.	Punt 13	_____ in.
Punt 4	_____ in.	Punt 14	_____ in.
Punt 5	_____ in.	Punt 15	_____ in.
Punt 6	_____ in.	Punt 16	_____ in.
Punt 7	_____ in.	Punt 17	_____ in.
Punt 8	_____ in.	Punt 18	_____ in.
Punt 9	_____ in.	Punt 19	_____ in.
Punt 10	_____ in.	Punt 20	_____ in.

Name _____ Date _____

How Far Did You Kick?

You have collected data on how far you can kick a football. Now construct a line plot to display your data. Use the following questions to guide you as you create your line plot in the space below.

-What is the smallest distance that you need on your scale?
-What is the largest distance that you need on your scale?
-Are the numbers on your scale in order and evenly spaced?
-How many Xs do you need for each distance?
-Are all of your distances represented on the line plot?
-What title do you want for your line plot?
-What label do you want for your line plot?

Cheers

We've Got Line Plots

Teach this cheer to the class and then split them into 2 groups. One group says the cheer to the other group and then the 2nd group echoes it back. Say each part one time.

We've got line plots, yes we do!
We've got line plots how about you? (First group)

We've got line plots, yes we do!
We've got line plots, how about you? (Second group)

We collect data, yes we do!
We collect data, how about you? (First group)

We collect data, yes we do!
We collect data, how about you? (Second group)

We make line plots, yes we do!
We make line plots, how about you? (First group)

We make line plots, yes we do!
We make line plots, how about you? (Second group)

Give Me a…

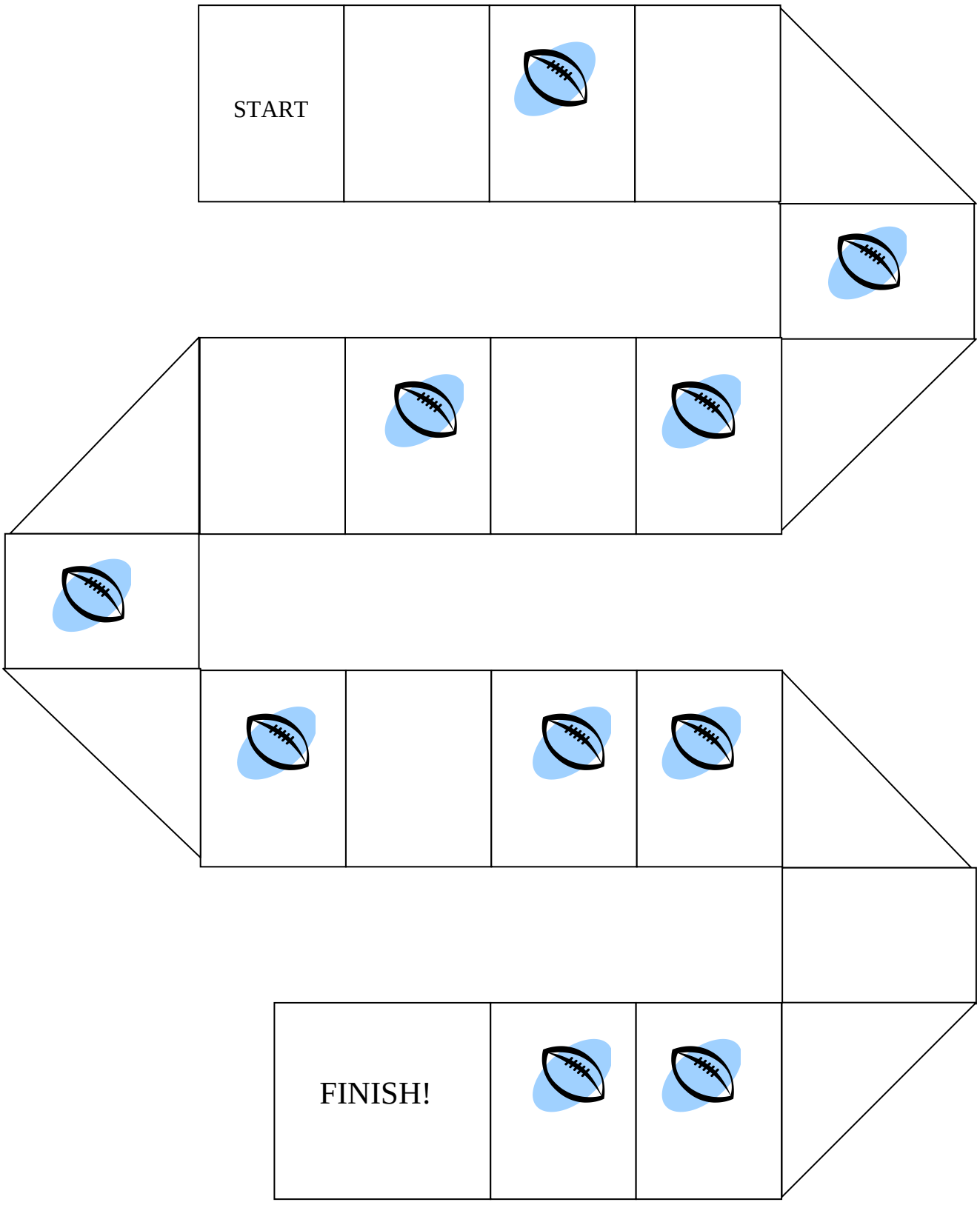
The teacher leads this cheer to review all the parts of a line plot. The teacher starts by saying "Give me a _____" and filling in a part of a line plot (title, label, numbers, number line, X, scale, etc.) The students respond by saying, "You got your _____, you got your _____." They fill in whatever part the teacher named. Repeat until you have named all the parts and then the teacher says, "What will we make?" The students will say, "A line plot." Teacher and students repeat this 2 more times and then cheer and clap!

FOOTBALL FANATICS LINE PLOT GAME

Directions to play:

- This game is for 2 players.
- You need a number generator (die), the game board and the line plot question cards.
- Place the question cards face down near the game board.
- Roll a number generator (die).
- Move the number of spaces rolled.
- If you land on a football, select a question card and answer it.
- If you get the answer correct, you get to keep the card. Check with your playing partner about the correctness of the answer to see if you both agree that you are correct.
- If you get the answer wrong, put it back on the bottom of the card pile.
- Move along the game board until you get to finish.
- When both players get to the finish, count your cards. The player with the most cards WINS!

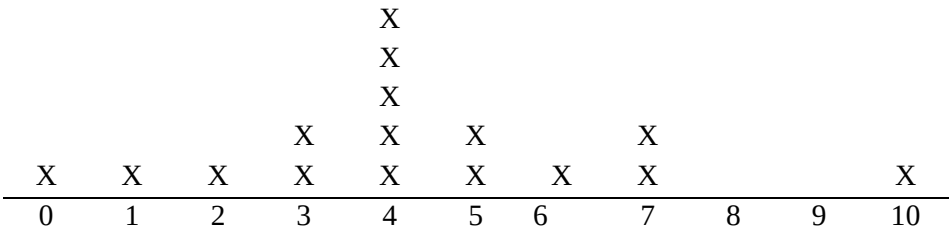
Football Fanatics Game Board



Football Fanatics Line Plot Game Question Cards

Copy and cut apart the cards on the following pages to use with the Line Plot Game. Make enough copies for each group of students.

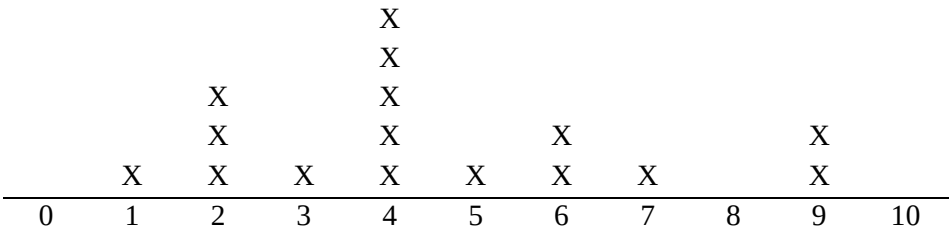
Baseball Hats



Number of Baseball Hats

How many people have more than 4 hats?

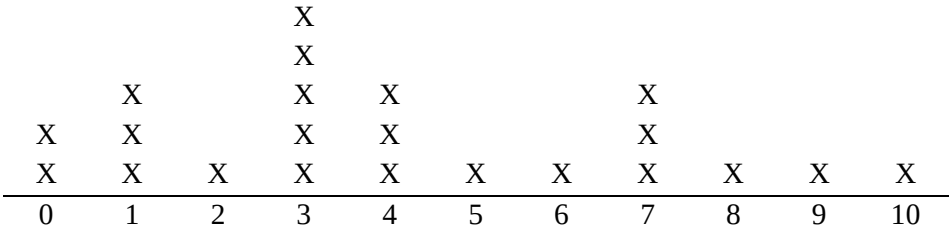
Watching Dolphins



Number of Dolphins

How many people saw at least 3 dolphins?

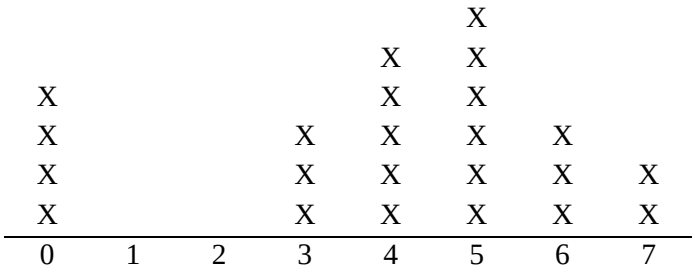
Photographs Taken



Number of Photographs

How many people took fewer than 3 photographs?

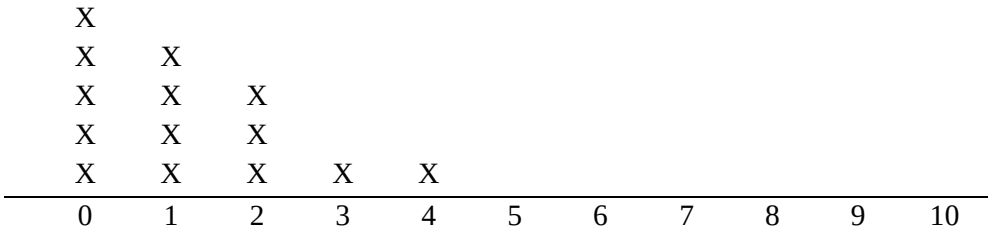
Eating Cereal Last Week



Times Cereal was Eaten

How many people answered this question?

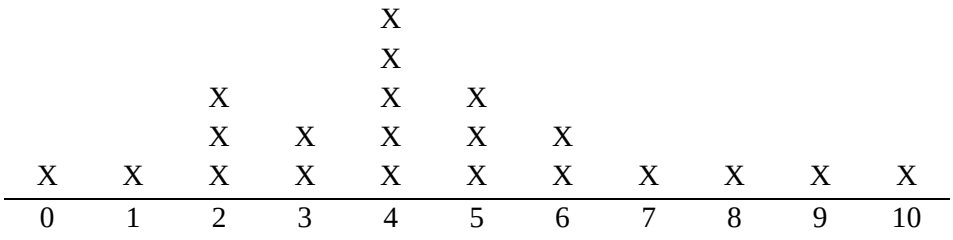
Trips to the Museum



Number of Trips

How many people went to the museum more than one time?

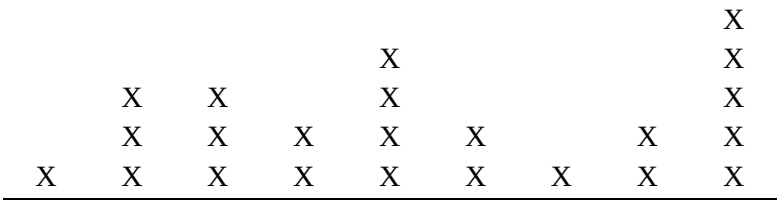
Guessing Numbers



Number of Times the Number was Guessed

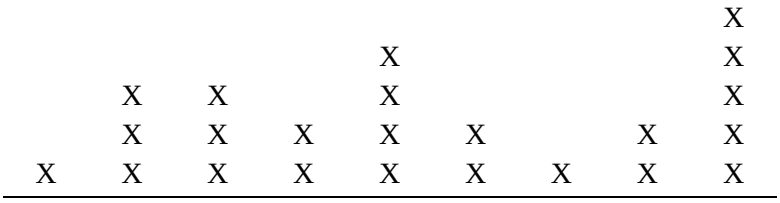
What number was guessed the most times?

Scores on a Spelling Test



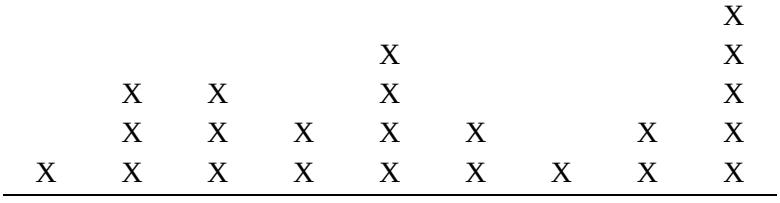
What score did the fewest people receive?

Scores on a Spelling Test



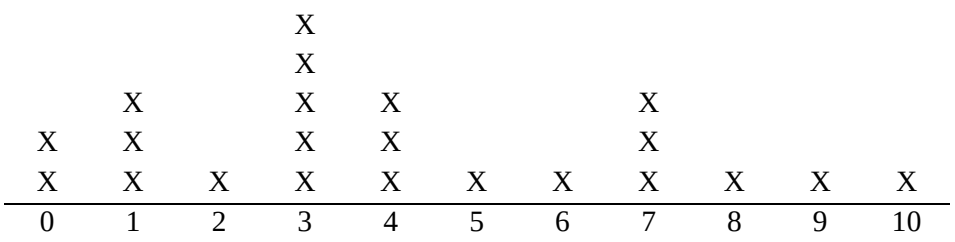
What score did the most people receive?

Scores on a Spelling Test



How many students took this spelling test?

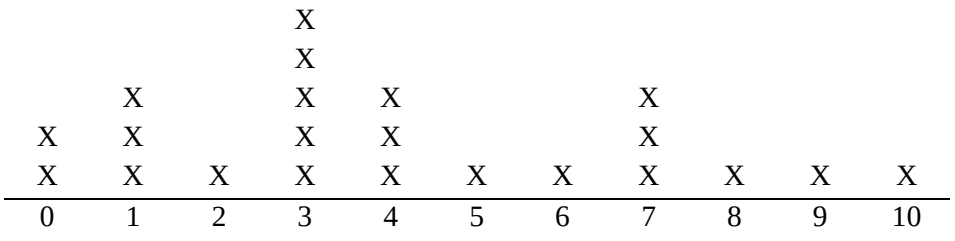
Trips to the Mall



Number of Trips

How many people went to the mall fewer than 2 times?

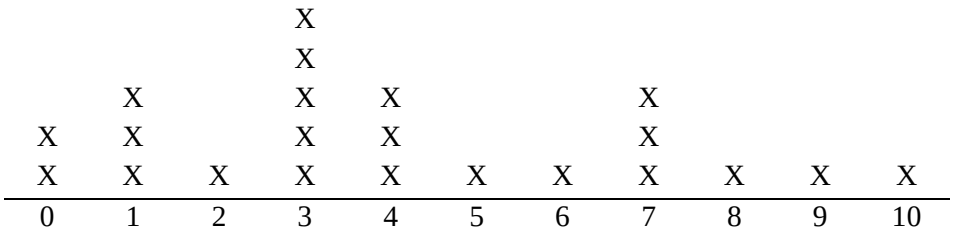
Running Laps



Number of Laps

How many students ran 7 laps?

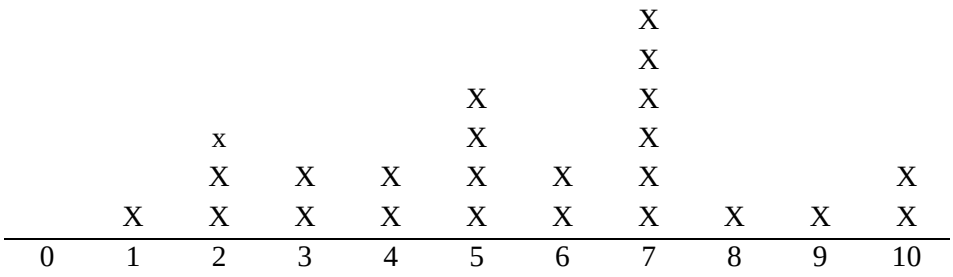
Tennis Matches



Number of Matches Won

How many players answered this question?

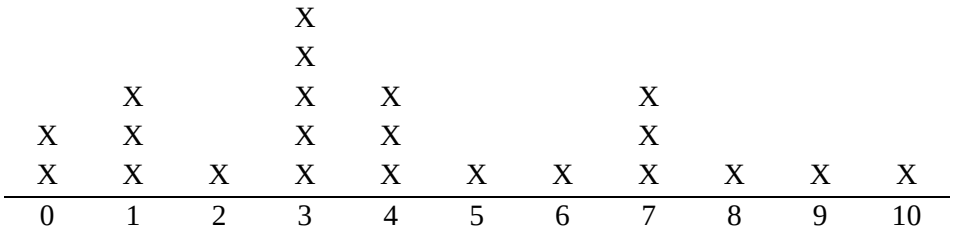
Scores on a Radio Quiz Show



Score

How many people scored 5?

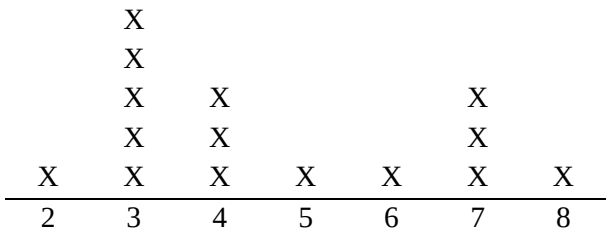
Planting Seeds in a Garden



Number of Seeds Planted

How many people planted fewer than 4 seeds?

Family Sizes



Number of People in a Family

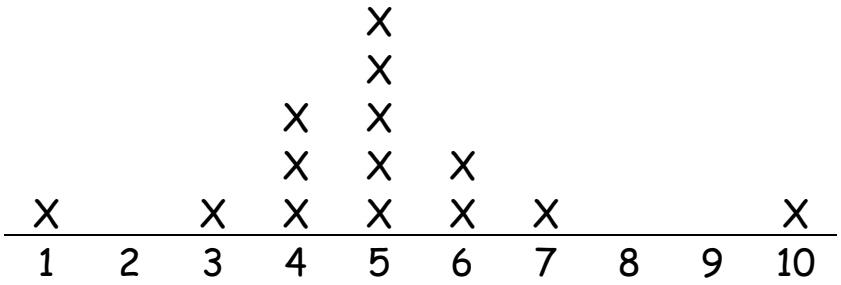
What is the mode?

Name _____ Date _____

Football Fanatics
Summative Assessment

Mr. Flacco coaches a football team. At the end of the season, he counted how many passes each of his receivers had caught. He used this data to create the line plot shown below.

Passes Caught During The Season



Use Mr. Flacco's line plot to answer the following questions.

1. What is the range of the data?

   _____

2. How many more players caught 4 passes than 7 passes?

   _____

3. How many players caught 9 passes?

   _____

4. What is the mode of the data?

_____

Explain how you know your answer is correct. Include what you know about mode in your response.

_____

_____

_____

_____

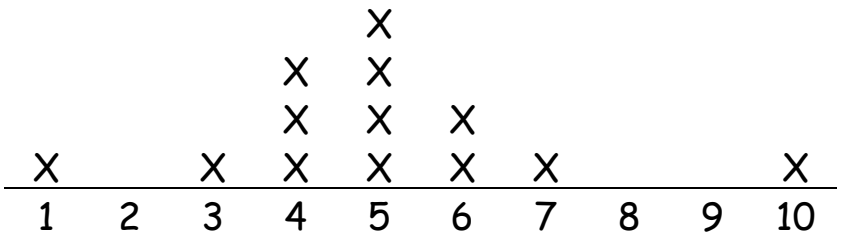
_____

_____

Football Fanatics
Summative Assessment Answer Key (Answers are in bold).

Mr. Flacco coaches a football team. At the end of the season, he counted how many passes each of his receivers had caught. He used this data to create the line plot shown below.

Passes Caught During The Season



Number of Passes

Use Mr. Flacco's line plot to answer the following questions.

1. What is the range of the data?

   9

2. How many more players caught 4 passes than 7 passes?

   2 players

3. How many players caught 9 passes?

   0 players

4. What is the mode of the data?

5

Explain how you know your answer is correct. Include what you know about mode in your response.

Answers may vary. Students should include the definition of mode in their response. One sample response is given below:

The mode is the piece of data that happened the most times. I looked at the line plot and saw that 4 players caught 5 passes. 5 had the most Xs. All of the other numbers had less Xs. 5 is the mode because it happened most often.

Tickets to See the Super Bowl

Copy enough tickets for each child in your class. Cut them apart and distribute them after the students have completed all the challenges and taken the assessment.

Congratulations! You have a won a ticket to see the Super Bowl! Check your local TV listings for the channel and time and enjoy watching the game with your family!

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